

Target distance – 50 cm

KVP – 120 KVP

Dose rate – 450 r per minute

Total dose received approximately - 1800 r in 4 min.

In each experiment, 50 males were irradiated under similar conditions. The newly-hatched wild irradiated males were allowed to grow for at least 2 to 3 days and were then mated for four days with a first set of 40 virgins (wild type). Similarly 2 day old irradiated males were immediately mated with 50 four day old virgin females. After four days these males were separated and mated with another set of 40 wild virgins. Again after four days, these males were separated and mated again with another set of 40 wild type virgin females. After 12-16 days, F<sub>1</sub> progeny were collected from all the bottles and observed for any variant. Pair mating was made from these F<sub>1</sub> flies. F<sub>2</sub> progeny from vials were carefully examined for any variations from the wild type.

Six males were obtained in one of the vials which showed brownish eye color appearance that resembles *garnet* eye colour sex linked recessive mutation of *D. malerkotliana* (Singh and Singh, 2013). They were crossed with wild type virgin females. Next generation progeny were normal and, when they were pair mated, some of the male progeny showed *garnet* eye color. By making pair matings from these flies, mutant females and males were obtained and a separate stock of *garnet* eye color could be established. In order to confirm the inheritance pattern, virgin *garnet* eye color females of *D. parabipectinata* were collected from the stock and were mated with wild type virgin males. All the F<sub>1</sub> males showed *garnet* (*g*) eye color phenotype (Figure 1) showing sex linked inheritance. This is the first report of phenotypic marker in this species.



The *garnet* eye color of *D. parabipectinata* shows resemblance with that of *garnet* eye color mutation of *D. malerkotliana* (Singh and Singh, 2013). Since both the species belong to the *bipectinata* species complex and are closely related and same mutation has been induced by X-rays, the loci may be very susceptible to X-rays in both the species.

Figure 1. Garnet eye color phenotype in *Drosophila parabipectinata*.

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### A new mutation of PDA synthase, *sepia*, isolated from wild *Drosophila melanogaster*.

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A natural mutation of *sepia* was identified among the descendants of *Drosophila* collected in Kiel, Germany in 2009. The flies were inbred for six generations with a chain of repeatedly isolated single sib-pair matings. The phenotype was recognized as consistent with classical *sepia* (CG6781; Bridges and Morgan, 1923) and the location was confirmed by a complementation test with *se*<sup>1</sup>. Part of the PDA synthase gene region was amplified and sequenced with a set of primers (5'-CTATCACCACTTGCATCTCTGGACC, 5'-GGAACCGGTTATGGACTGCATTTAT, 56°C annealing, Kim *et al.*, 2006) and the nature of the mutation was found to be a 40 base pair frameshift deletion in the second exon from position 3L:8521107..8521146 [+] (bases 461-500 of the CDS), which creates a premature stop codon at codon position 157 (the *sepia* gene product is normally 243 amino acids long). The deleted sequence is 5'-AGAATGCCCGTCTGCTCGCCACCAAAGAATTCCGTACCAC. A set of diagnostic primers was designed with one primer within the deleted region that can test for the presence of the allele in heterozygotes by PCR (5'-GTGGGTAGAGCCAGGAAACC, 5'-TCTGCTCGCCACCAAAGAAT, 60°C annealing). This allele is likely an amorph and is only the second molecularly characterized mutation of *sepia*. The allele, *se*<sup>Kiel</sup>, has been deposited at the Bloomington Drosophila Stock Center (Bloomington, IN 47405) as stock 55131 and is listed in FlyBase (St. Pierre *et al.*, 2014) as <http://flybase.org/reports/FBal0294757.html>. Stocks obtained from the Bloomington Drosophila Stock Center (NIH P400D018537) were used in this study.

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### **New mutants of *Drosophila mediopunctata*.**

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For almost three decades we have been working with *Drosophila mediopunctata*, a species of the *tripunctata* group (Yotoko *et al.*, 2003), studying various aspects of its biology. In this note we describe new X-ray induced mutations in this species. We exposed three hundred males from two homokaryotypic strains ([150 males ITA-24P, phenotype: wild; chromosome karyotypes: II: *DA-PA0/DA-PA0*; III: *St/St*; IV: *St/St*; V: *St/St*; X: *St/Y*]; [150 males ITC-229ET, phenotype: wild; chromosome karyotypes: II: *DI-PB0/DI-PB0*; III: *St/St*; IV: *St/St*; V: *St/St*; X: *St/Y*]) to three X-ray doses (2200 rad; 4400 rad; and 6600 rad; equivalent to the absorbed dosage suggested by Marques *et al.*, 1991). After one day of recovery, irradiated males were individually crossed with virgin females from the same strain or from a strain (CR-27A or CR-32C) with four visible mutations marking each major autosome (as described by Hatadani *et al.*, 2004). In the first generation, we selected dominant visible mutations and those inherited in sexual chromosomes. Then, the F1 progeny were allowed to mate (brother-sister mating) to select recessive mutants in the F2 using the marked chromosomes.

We obtained three new *Delta* ( $\Delta$ ) alleles ( $\Delta_6$  and  $\Delta_7$  located in *DA-PA0* chromosome from different X-ray mutated males ITA-24P;  $\Delta_8$  located in *DI-PB0* from an X-ray mutated male from ITC-229ET). *Delta* is a dominant mutation that produces deltas at junctions of wing veins, or wing veins with margins (Figure 1). We also found flies with yellow body color, named “*louro*” (*ll*<sub>3</sub>) mutation from irradiated strain ITC-229ET flies (Figure 2). This mutation is recessive and linked to the X chromosome. It is probably homologous to *D. melanogaster yellow* gene. Our perspective is to develop new mutations and balanced strains with visible and cytological markers in all chromosomes in this species.